

Comparative Risk Return Analysis of Bombay Stock Market With Selected Banking Stocks in India

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ABSTRACT

The stock markets are contributing a voluminous extent in progress of the economy in India. The banking sector engages major share among other sectors in Indian stock trading scenario. The study examines the correlation between risk and return of the Sensex and banking stocks of BSE (Sensex). In this study different Sensex and banking stock indices have been used to examine the risk return trade off of Sensex with that of HDFC Bank, ICICI Bank, Axis Bank and SBI. The study is based on secondary data. The data for the analysis has taken from the BSE website over a period of 13 years from January 1, 2005 to December 31, 2017. In this analysis for testing the presence or absence of risk return trade off in the Indian equity markets and for testing hypothesis, different methods like correlation, regression, descriptive statistics and t test have been discussed.

Keywords: BSE, Banking Stocks, Return, Stock market, Risk

I. INTRODUCTION

In the age of growing Liberalization, Privatization and globalization in the emerging economics, stocks markets play an important part and it turn as indicator reflecting the performance of the country's economic condition. Stock market is a place where buying and selling of financial securities use to take place. It is mainly due to a high degree of volatility; prices fluctuate within minutes and are determined by the demand and supply of stock in a given time. The buyer and sellers trade on different financial securities in the stocks market, which is encounter to accomplish their financial objectives from their investments. Investments in stock market involve future uncertainties, which is the risk has to tolerate by all the investors for the expected returns. Therefore investments in stock market comprise both risk as well as returns. The investors have a lodged concerned in the stock market to accomplish higher returns. In the contemporary situation, researches also are compelling extreme notice on stock market by

using efficient procedures, which in turn will be advantageous for investors over their market analysis.

Stock market in India has two main stock markets specifically, Bombay stock Exchange (BSE) and National Stock Exchange (NSE). Indian Stock market has seen a fore most alteration afterward the employment of liberalization, where the free flow of information' were the fore most factors on different stock market indices. India is developing economy; it has eye witness an extreme alteration in the financial market (both capital market as well as money market) in last two decades. Flls have also taken an acute interest in Indian stock market, consequence India prosperous enough to acquire a major segment from foreign investors in recent period. This has likewise increased the risk connected investment in financial securities. Henceforth, numerous investors assess their speculation occasion with the assistance of various techniques to minimize their risk through suitable pronouncement. In the assessment of investment opening for investors use to measure their risk and returns connected by it. Investors usually observer ups

and downs on indices to recognize the performance of the stock market.

The stock market grabs a vital domicile in Indian economy. The Bombay Stock Exchange (BSE) is one of the primogenital exchanges in India and World as well as in terms of superiority and advancement of technology. Banking sector played a vital role in Indian economy and banking stocks are the most important part of Bombay Stock Exchange (BSE). This study takes into consider the weekly closing prices of four major banking stocks of BSE (HDFC Bank, ICICI Bank, Axis Bank and SBI) to analyse the risk and return of the selected stocks. To examine the performance of these stocks, daily closing prices taken into consideration to analyse the risk return a period of thirteen years from 1st January, 2005 to 31st December, 2017.

The Bombay Stock Exchange (BSE) is an Indian Stock Exchange located at Dalai Street, Mumbai (Formerly Bombay) it is Established in 1875, the BSE is Asia's First Stock exchange, It claims to be the world's fastest stocks exchange with a median trade speed of 6 microseconds. The BSE is the world's 11th largest Stock Exchange with an overall market capitalization of more than \$2 trillion as of July, 2017.

The term stock exchange is the concept for the mechanism that the trading of company stocks. Trading at both the exchanges takes place through an open electronic limit order book, in which order matching is done by the trading computer. There are no market makers or specialists and the entire process is order driven, which means that market orders placed by investors are automatically matched with the best limit orders. As a result, buyers and sellers remain anonymous. The advantage of an order driven market is that it brings more transparency, by displaying all buy and sell orders in the trading system. All orders in the trading system need to be placed through brokers, many of which provide online

trading facility to retail customers. Institutional investors can also take advantage of the direct market access (DMA) option, in which they use trading terminals provided by brokers for placing orders directly into the stock market trading system.

II. LITRATURE REVIEW

Philippe Gergooire (2001) conducted a study on "Predictive Power of Technical Analysis: The moving average rules on European" According to him simple forms of technical analysis possessed significant forecast power on various market indexes. He shows that these results can be replicated on formally selected European indexes, which almost completely eliminates any influences from data – snooping. Implications of these results in terms of market-efficiency are also discussed.

Kapil and Sakshi (2010) made an attempt to explore the presence of validity of CAPM theory in Indian stock market. In order to test the applicability of CAPM in Indian context the study undertook the research in BSE 500 by identifying 278 companies and the return of the companies were computed and the same return was regressed with Market return to arrive the beta value with which the association could be ascertained in terms of risk and return. The study found that higher risk was not commensurate with high return indicating that the theory of CAPM was discounted in Indian context.

Similar study was carried out by Madhu and Tamimi (2010) to investigate the validity of CAPM in Indian context by analysing the drug industry comprising 60 companies from BSE during the period from 2001 to 2007. The result of the study brought to light that there was a proof indicating that the theory of CAPM was applicable in Indian context.

Soumya Guhadab & Sagarika Misra (2011) found that there was evidence of instability of betas especially in

the shorter time period and the instability was reduced when the beta estimation period increased. In addition to that the extreme betas showed the higher stability than the intermediate range of betas. Murthy Jogalapuram (2012) found that among the various return interval periods, half year return shows low risk and high return. Balakrishnan & Rekha Gupta (2012) showed that most of the portfolio betas were not regressed to the value one and also they proved the individual securities beta and portfolio betas are not related to each other.

Risk return trade-off is the significant deciding factor. Beta and several statistical models also used to test the association between the risk and return. Bhunia (2012) measured the Capital asset pricing model as measurement tool and established that there is no competence demonstrated in Indian market. Ratna (2013) examined the performance of IT stocks with banking stocks and the different statistical tools used for examining the hypothesis with descriptive analysis and t-test, suggested to hold stocks to accomplish the optimistic consequences.

Setiawan et.al, (2013) analysed the performance of Syariah stocks with orthodoxy stocks listed on Indonesia. This study used Risk-Adjusted Return dimensions. They originated that there is no significant difference on risk and returns, measured by weekly return, standard deviation and beta, between both Syariah and orthodoxy stocks. Additionally, they also appraised the performance of both Syariah and orthodoxy stocks portfolio. Ansar et.al (2014), established "A-Y Model" to find out the performances through risk and return of the portfolio and investigate during the bullish and the bearish market. The consequences of the model designates that there is no reliable performance exist between the portfolio expected return and board risk.

Sharma et.al, (2012) scrutinizes the risk return trade off of the stocks listed in the stock exchanges of South

Asia. This study aimed to find out, the expected return and risk connected over time by using the descriptive statistics. The study found that high returns and rational risk complicated in those South Asian countries. Shanmuga sundram, G. and Benedict, D. John (2013) deliberate risk influenced in the Indian Sectorial indices and Nifty. They found risk association in varied with time period. They had designated five Sectorial indices from NSE and Nifty Index for 8 years from 2004 to 2012. For the study t-Test and ANOVA carried out to find out the risk alteration between the sectors and Nifty.

III. OBJECTIVES OF THE STUDY

The objectives of this study are to capture the risk return analysis of sample banking stock. The aim is to help the investors (current and potential) understand the risk return trade off of banking stock at Bombay stock market. The objectives of the study are given below:

- ✓ To examine the relationship between risk & returns of Sensex and Banking stocks.
- ✓ To Analyse the constancy of beta for four Banking stocks of BSE Sensex with respect to Sensex.

IV. HYPOTHESIS

Keeping the objective in view, the hypothesis framed for the study is given by,

H₀: There is no significant relationship between Sensex returns and banking stock returns.

H₁: There is a significant relationship between Sensex return and banking stock return.

V. METHODOLOGY AND DATA COLLECTION

In this study different BSE Sensex and banking stock indices have been used to examine the risk return trade off of BSE Sensex with that of HDFC Bank,

ICICI Bank, Axis Bank and SBI. The risk and returns have been examined by using the weekly closing value of BSE Sensex and four banking stocks. The risk and return on Sensex have taken into consideration of the measurement of market return and market risk, correspondingly. BSE Sensex characterizes Study foremost primarily follow through market capitalization on BSE.

For this study, we can take secondary data like opening prices, Closing prices, High prices, Low prices of banking sectors for individual bank and collect BSE SENSEX rates. The data for the analysis has taken from the BSE website over a period of 13 years from January 1, 2005 to December 31, 2017. The data analysis will be carried out in IBM SPSS software and Microsoft Excel.

VI. STATISTICAL ANALYSIS

The main objective of the study is to comprehend the risk-return accompanying with BSE and other sample banking stocks as well as to construct a linear regression model keeping BSE Sensex index as dependent variable and other banking stock indices as independent variable. In this analysis for testing the presence or absence of risk return trade off in the Indian equity markets and for testing hypothesis, different methods like correlation, regression, descriptive statistics and t test have been adopted.

The Daily index returns of the stock markets have been computed using the following formula. The return has been calculated on the basis of the model:
 $rt = \ln (It/It-1)$

Where,

rt = Return on stock price

$\ln$ = Natural logarithm

It = the closing index

$It-1$ = the closing index

The standard deviation of all indices designed from the beneath mentioned formula to compute the risk associate with the return of indices.

$$\sigma = \sqrt{((x_1 - \mu)^2 + (x_2 - \mu)^2 + \dots + (x_n - \mu)^2) / n}$$

Where $\mu = (x_1 + x_2 + \dots + x_n) / n$ (1)

Where mean and standard deviation for each selected Bank is as follows:

Return of Weekly Stock Market

Table 1

	HDFC	ICICI	AXIS	SBI
Mean	3.986838	3.620717	3.529814	3.616629
Std.Dev	1.235435	1.143146	1.181894	1.185543

Correlation find out the linear relationship among two variables is measured by the correlation coefficient. In assumed set of explanations (x_1, y_1) , $(x_2, y_2), \dots (x_n, y_n)$, can be derived by computing the correlation coefficient(r)

$$r = \frac{1}{n-1} \sum \left(\frac{x - \bar{x}}{s_x} \right) \left(\frac{y - \bar{y}}{s_y} \right)$$

Beta (β) measures the market risk or systematic risk. Beta is commonly computed by the under given formula.

Weekly % Change = (Today's week Price - Last week's price) / Last week's Price * 100

DESCRIPTIVE STATISTICS:

Table 2

Particulars	SENS EX	HDFC	ICICI	AXIS	SBI
Mean	4.139359	3.986838	3.620717	3.529814	3.616629
Std.Dev	1.0843099	1.235435	1.143146	1.181894	1.185543

				89 3	435
Kurto sis	3.812	1.254	1.650	2.7 37	1.4 27
Skew ness	1.290	0.971	0.978	0.8 98	0.7 72
Range	8.609 4	8.481 8	7.664 5	11. 50 62	8.2 997
Min.	1.502 2	1.225 0	1.015 1	- 2.2 74 6	0.2 168
Max.	10.11 16	9.706 7	8.679 6	9.2 31 6	8.5 165

Descriptive Statistics are being uses to survey the central tendency (position) of data.

In Descriptive statistics covered Mean, Standard Deviation, Kurtosis, Skewness, Range, Minimum and Maximum.

Following summarizes the statistical results of weekly stock market returns of different stock indices from January 2005 to December 2017 by the help of Descriptive Statistics.

Descriptive Statistics of the Returns

It has observed from above during the study period i.e. from January 2005 to December 2017, all indices showed positive average weekly returns.

The average weekly returns recorded highest of 4.139359 in case of SENSEX, where as it found lowest of 3.529814 in case of AXIS Bank. The average weekly return of SENSEX is found to be 4.139359, which is more as compare to HDFC Bank, ICICI Bank, AXIS Bank, SBI Bank. Therefore from the above clearly

suggest that average weekly return of SENSEX is higher than of all Banking stock returns.

On the contrary, the standard deviation of SENSEX is lower most associate to all Banking stock returns. The standard deviation of HDFC stock return is uppermost for the mention period. Therefore it indicates the HDFC stock encompasses maximum risk than that of all other stocks returns, while SENSEX return comprises minimum risk.

The weekly returns distribution of all sample stock returns are found to be positively skewed. All stocks are observed peaked by nature i.e. it is lowest in case of HDFC and more peaked in case of SENSEX.

CORRELATION BETWEEN BSE SENSEX AND BANKING STOCK RETURNS:

Correlation find out the linear relationship among two variables is measured by the correlation coefficient.

The following Table elaborates the correlation for weekly stock returns of SENSEX and Banking stock over a span of thirteen years from January 2005 to December 2017.

Hypothesis:

H₀₁: There is no correlation with SENSEX and HDFC Bank.

H₀₂: There is no correlation with SENSEX and ICICI Bank.

H₀₃: There is no correlation with SENSEX and AXIS Bank.

H₀₄: There is no correlation with SENSEX and SBI Bank.

Correlations

Table 3

		SENSE X	HDF C	ICIC I	AXI S	SBI
SENSE X	Pearson Correlati on	1	.404**	.432*	.309**	.339**

HDFC	Sig. (2-tailed)		.000	.000	.000	.000
	N	642	642	642	642	642
	Pearson Correlation	.404**	1	.265*	.294**	.198**
ICICI	Sig. (2-tailed)	.000		.000	.000	.000
	N	642	642	642	642	642
	Pearson Correlation	.432**	.265**	1	.343**	.334**
AXIS	Sig. (2-tailed)	.000	.000		.000	.000
	N	642	642	642	642	642
	Pearson Correlation	.309**	.294**	.343*	1	.267**
SBI	Sig. (2-tailed)	.000	.000	.000		.000
	N	642	642	642	642	642
	Pearson Correlation	.339**	.198**	.334*	.267**	1

** . Correlation is significant at the 0.01 level (2-tailed).

From the table, it can observe that weekly stock market returns of SENSEX are correlated with that of all banking stocks returns. The SENSEX return is highly correlated with that of HDFC Bank and less correlated with AXIS Bank.

Here, we can see that the p value of HDFC Bank is $0.404 \geq 0.05$. So we reject our H_0 there is correlation between SENSEX and HDFC Bank. Same for other Banks like ICICI Bank, AXIS Bank, SBI Bank has p-value is respectively 0.432, 0.309, and 0.339 which is $\geq$

0.05 so we reject our H_0 . There is correlation between SENSEX with ICICI Bank, AXIS Bank, SBI Banks.

Table 4

	HDFC	ICICI	AXIS	SBI
Return/Beta	4.199746	2.462146	2.102305	3.763491
Rank	1	3	4	2

ANALYSIS OF BETA WITH REFERENCE TO SENSEX

Beta (β) measures the market risk or systematic risk. Beta is computed by the given formula:

$$\text{Weekly \% Change} = (\text{Today's week price} - \text{last week's price}) / (\text{Last week's price}) * 100$$

Beta (Market risk) of all sample banking stocks with reference to SENSEX found out as discussed below.

Beta Coefficient of weekly stock Market Returns

Table 5

	HDFC	ICICI	AXIS	SBI
BETA	0.949304	1.470554	1.679021	0.960977
Rank	1	3	4	2

The above table displayed that HDFC Bank is greatest defensive stock. It is positively sensitive to variation happening to SENSEX. However Axis Bank is greatest sensitive stock, its return existence 1.679021 which specifies variation in SENSEX will gave 1.679021% change in Axis Bank Return and formerly next to it are ICICI Bank and SBI.

ANALYSIS RETURN PER VOLATILITY:

The following table is weekly return per volatility:

Return per Volatility weekly stock Market Returns

Above Table demonstrations the ranking of banking stock returns according to return per volatility measured in terms of beta. HDFC Bank stock return higher as compare to other in the case of return per volatility and AXIS Bank Stock return has positioned at backseat, which designates that if investors have to

select among different stocks then HDFC Bank has performed better than that of other stocks throughout the study period.

ANALYSIS RETURN PER STANDARD DEVIATION:

The following table is return per standard Deviation weekly stock market:

Return per Standard Deviation Weekly Stock Market

Table 6

	HDFC	ICICI	AXIS	SBI
Return/S.D	3.22707	3.16732	2.98657	3.05060
Rank	3	8	5	8
	1	2	4	3

Above table indicates the position of different banking stocks returns with the relation to standard deviation. Here it can observe that HDFC Bank has performed better (less risky), than other bank throughout the study period, whereas Axis Bank has to improve in measure of return per standard deviation for reducing the risk.

PAIRED T- TEST:

The following table shows the t-statistics Significance results and P-Value of weekly returns for different stock returns for the study period from January 2005 to December 2017.

Hypothesis:

H₀: There is no significant difference between SENSEX return and Banking stock return.

H₁: There is significant difference between SENSEX return and Banking stock return.

Significance Test Results of Comparisons of Different Stock Index

Table 7

	HDFC	ICICI	AXIS	SBI
t-stat	3.037	11.063	11.574	10.131
P Value	0.251152	0.610698	0.712957	0.624048
	1	2	4	5

The p-value of 0.2511521, 0.6106982, 0.7129574 and 0.6240485 respectively of four banking stocks returns i.e. HDFC Bank, ICICI Bank, AXIS Bank and SBI has ≥ 0.05 it indicate, there is significant difference between weekly returns of SENSEX and other sample stock returns at 5% degree of significance. Therefore the null hypothesis is there is no significant relationship between SENSEX returns and Banking stocks returns are Reject and we accept our H₁.

TEST OF NORMALITY:

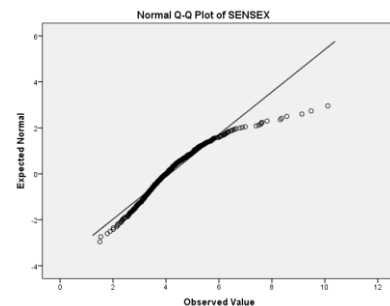


Figure 1

From the following table we can see the normality of SENSEX and Banking Return.

REGRESSION RESULT FOR RETURNS ON SENSEX AND VARIOUS STOCK

The following tables shows the Regression Results on Sensex Depended variable and Various Stock Returns as Prediction.

(a) Model Summary

Table 8

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.560 ^a	.313	.309	.9014491	.313	72.608	4	637	.000

a. Predictors: (Constant), SBI, HDFC, AXIS, ICICI

(b)ANOVA^a

Table 9

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	236.009	4	59.002	72.608	.000 ^b
1 Residual	517.633	637	.813		
Total	753.642	641			

a. Dependent Variable: SENSEX

b. Predictors: (Constant), SBI, HDFC, AXIS, ICICI

(a) Coefficients^a

Table 10

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	1.398	.167		8.358	.000	1.069	1.726
HDFC	.238	.031	.272	7.745	.000	.178	.299
ICICI	.258	.035	.273	7.420	.000	.190	.327
AXIS	.083	.033	.090	2.485	.013	.017	.148
SBI	.156	.032	.170	4.798	.000	.092	.219

a. Dependent Variable: SENSEX

The above table's (a), (b) and (c) derived the regression analysis between Sensex returns as dependent variable with the banking returns as independent variables. The goodness of fit consequences of standard linear multiple regressions through Sensex as the dependent variable and numerous determinants as forecasters are described in Table (a) and the model result has elaborated in Table (b). The F-statistics value of 72.608 ($P < 0.01$) show that the independent variables are jointly statistically significant at 1% level. This model discloses that statistically significant association among Sensex and all banking stock returns (Sig. < 0.05). The regression result in table (c) indicates that the coefficient for all banks and is statistically significant at 1 per cent level, with p-value of 0.0000. The model coefficients have

revealed in Table (c) and the outcomes designate that Sensex are significant ($p < 0.05$ in all cases) and except AXIS Bank. This study indicates that, the association among Sensex returns and banking stock returns by suggesting that there are statistically significant associations among Sensex returns and on the banking stock returns.

VII. CONCLUSION

In this study, the Sensex returns and Banking stock returns have been used to find out the comparative risk return analysis between Sensex returns with that of sample banking stock returns. More specifically, to examine the correlation four major Banking stock market indexes & returns, (the HDFC Bank, the ICICI Bank, the AXIS Bank and the SBI), with BSE Sensex index return, during the period January 2005 to December 2017. Results obtained from the correlation analysis reveals that Sensex returns is high correlation with ICICI Bank returns and positive correlation between all Bank returns. On the other hand, from descriptive analysis it can found that Sensex returns as well as all the stock returns positive average weekly returns. The Sensex generated high returns, as compared to all other stock. HDFC Bank return shows the highest volatility during the period. In the case of t test and the p-value, it can conclude that returns of different stock returns that there is no significant difference between Sensex and banking stock returns.

It is clear from the above that the Null Hypothesis (H_0), there is no significant difference between returns of Sensex and banking stock returns is rejected. In the case of market risk HDFC bank is greatest defensive stock, whereas AXIS Bank is greatest sensitive stock, which highly varies with Sensex return. All the banking stocks change in similar trend of Sensex since the values of beta are positive. The regression analysis study indicates that, the association among Sensex returns and banking stock returns by suggesting that statistically insignificant

associations among Sensex returns and on the banking stock returns.

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